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CAN THE CURRENT ACQUISITION PROCESS MEET OPERATIONAL NEEDS?

by

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Abstract

Since the 1950s the acquisition system has been modified and changed many times to clean up the system and prevent fraud, waste, and mismanagement. However, the system had become too big, cumbersome, and unresponsive to meet operational needs. In 1985 the President's Blue Ribbon Commission on Defense Management, the Packard Commission, was established to make recommendations for new reform. In June 1986 the commission published its final report that made sweeping recommendations. Those recommendations were implemented by the National Security Decision Directive 219 in April 1986, the Goldwater-Nichols Department of Defense Reorganization Act in October 1986, and the Defense Management Report in July 1989. Since then, many changes have occurred that have improved operational perspective and jointness in acquisition planning, linked national security objectives to system acquisition, and improved acquisition management. The changes that have taken place so far have not solved all of the problems in the acquisition system, but they have had a major impact in improving system and ensuring that a new weapon system will meet operational needs.

Chapter 1

Introduction

The military acquisition system has always been under heavy scrutiny and continuous revision. This scrutiny and desire to improve the system are understandable considering the extremely large amount of government funding involved, the potential for waste, and the importance of many of the systems to the national defense. Since the 1950s the acquisition system has been modified and changed many times to clean up the system and prevent fraud, waste, mismanagement, and produce products that meet operational needs.[1] However, by the early 1980s the American public and politicians saw almost daily in the news how the system was badly broken and unable to produce a cost effective and operationally effective weapon system. Those that had inside knowledge of the system knew that things were not as bad as the newspapers were saying, but they did know that the system had become too big, cumbersome, and unresponsive to meet operational needs.[2] Due to these problems and the concern that the Joint Chiefs of Staff and the service secretaries were ineffective due to service bureaucracies, President Reagan established in 1985 the President's Blue Ribbon Commission on Defense Management, which became known as the Packard Commission. In June 1986 the commission published its final report that made sweeping recommendations. Those recommendations became the basis for three implementing vehicles: the National

Security Decision Directive 219 in April 1986, the Goldwater-Nichols Department of Defense Reorganization Act in October 1986, and the Defense Management Report in July 1989.[3] All of these actions were implemented to improve the military advice to the senior leadership, improve military strategic planning, improve acquisition management, and provide better linkage between national security objectives and the DOD budget request for weapon system development and procurement.[4] This paper will examine some of the changes that have been implemented since the Packard Commission and show that these changes have improved the acquisition system and the probability that a new weapon system will meet operational requirements. In particular, this paper will look at how these changes have improved operational perspective and jointness in acquisition planning, linked national security objectives to system acquisition, and improved acquisition management. Before examining some of the implemented changes we must first establish an understanding of the general acquisition process and some of the problem areas.

Notes

[1] Fredrick P. Biery, "The Effectiveness of Weapon System Acquisition Reform Efforts," Journal of Policy Analysis & Management, Fall 1992, pp. 648-647.

[2] Edward N. Luttwak, *The Pentagon and the Art of War: A Question of Military Reform* (New York: Simon ans Schuster, 1984), pp. 130-133.

[3] Lt Col Robert D. Dillman, *The DOD Operational Requirements and System Concepts Generation Process: A Need for More Improvement* (Maxwell AFB, AL: Nov 1993), pp. 3-4.

[4] Ibid., pp. 4-5.

Chapter 2

The Process and Problems

The Defense Acquisition Process

The defense acquisition process is based on a disciplined approach for integrating the efforts and products of three major decision support systems: the requirements generation system; the acquisition management system; and the Planning, Programming, and Budgeting System (PPBS).[1] The requirements generation system is responsible for identifying and documenting operational mission needs for fixing shortcomings in existing systems or for new operational capabilities. These mission needs are identified by the weapon system users by continuous assessments of current and projected military threats.[2] The acquisition management system translates the user's needs into an operational system. This management system uses a structured, event-driven process that links milestone decisions to demonstrated accomplishments. This process provides the basis for making informed tradeoff decisions based on affordability constraints and user's needs.[3] The PPBS system provides the means for planning the funding for the research, development, test and evaluation, procurement, fielding, and maintaining of a new or modified weapon system. It is the integration of these three support systems that has caused a lot of the problems in the acquisition process. Without proper requirements

identification, it is difficult for the acquisition system to produce what the user really needs. Without good acquisition management, a system could meet most of the requirements but not work properly operationally or be too expensive to procure. Without proper PPBS planning, a system could be designed and tested without the budget to field it. Even though all three are very important, this paper will primarily focus on the first two systems and their processes which will be referred to as the requirements process and the acquisition management process.

The disciplined approach to the entire acquisition process is based on the integration of the requirements, acquisition management and the PPBS to a set of milestone decisions and acquisition phases. Figure 1 depicts the current text book approach for a major defense acquisition program. The acquisition process for a major defense acquisition program is the most complicated and has the highest level of oversight.

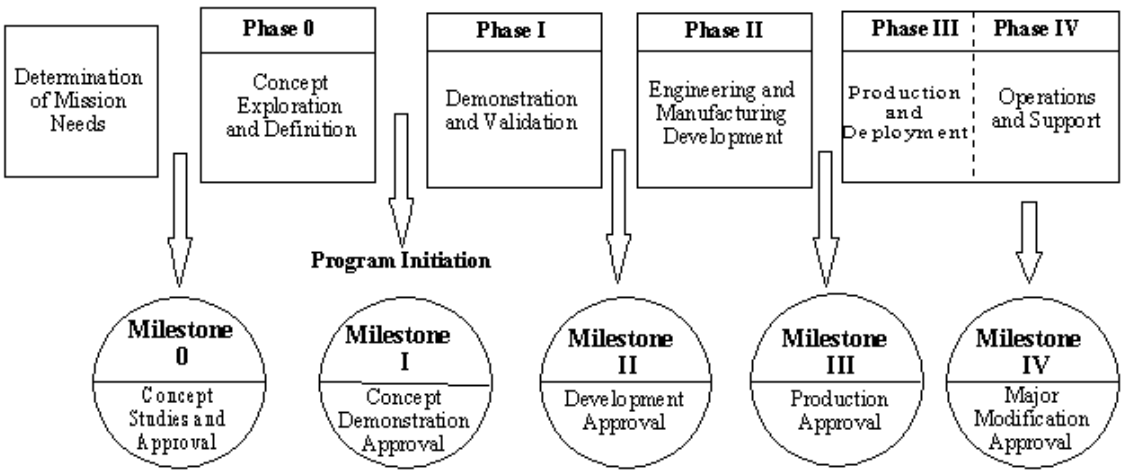

Figure 1. Acquisition and Milestone Phases

A program is designated as a major program, or Acquisition Category (ACAT) I, by the Under Secretary of Defense for Acquisition and Technology or if estimated to cost more than $300 million in research, development, test, and evaluation (RDT&E) or total expenditure of $1.8 billion.[4] If an acquisition program is not for a new system or the system is a lower ACAT (i.e., II, III, IV) the appropriate acquisition decision authority may streamline the process by combining phases and milestones or by requiring less documentation at the milestones. We will look at the process for an ACAT ID program, where the Milestone Decision Authority (MDA) is the Under Secretary of Defense for Acquisition and Technology [USD(A&T)], since all other programs are all subsets of it.

The entire process starts when the requirements system identifies an operational need that can not be satisfied by nonmaterial solutions and produces a Mission Need Statement (MNS). Once the MNS is approved by the Service Chief of Staff and validated by the Joint Requirements Oversight Council (JROC), the USD(A&T) convenes the Defense Acquisition Board (DAB). The DAB reviews the MNS and makes recommendations to the MDA, if appropriate, for concept studies of a minimum set of alternative. This review and MDA approval constitutes the Milestone 0 decision, Concept Studies and approval, and directs the initiation of Phase 0, Concept Exploration and Definition, with an Acquisition Decision Memorandum (ADM).[5] During this phase, studies are used to evaluate the feasibility of alternative concepts and determine their potential cost, schedule, performance, and acquisition strategies. Phase 0 ends when the DAB reviews the affordability of the promising alternatives and makes a recommendation to the MDA on what concept(s) and acquisition strategy to pursue at Milestone I, Concept Demonstration Approval. The approved recommendations from the DAB are reflected in the Milestone I ADM and constitute the initiation of an acquisition program. During Phase I, the concepts are examined closer with respect to different design approaches and technologies. Cost drivers, risks, alternatives, and potential cost tradeoffs are determined. During this phase testing, prototyping and early operational assessments are used to evaluate performance and operational suitability. At Milestone II and all following milestones, the DAB rigorously assesses the entire effort up to that point. It reviews the requirements, affordability, tests results, procurement strategy, and risks associated with the concept(s) and establishes a development baseline.[6] A favorable decision by the MDA results in an ADM that outlines the modified, if required, acquisition strategy and

baseline for the approved concept. It may also identify a low-rate initial production quantity if appropriate.[7] During Phase II, Engineering and Manufacturing Development, the most promising design approach is transformed into a stable, producible, and cost-effective system design. The manufacturing and production processes are validated and the system's capabilities are tested. During this phase, developmental and operational testing are accomplished on integrated and production representative systems. At Milestone III, Production Approval, the DAB determines if the results up to this point warrant continuation and movement of the program into production. A favorable decision is reflected in an ADM that contains an approved acquisition strategy and Acquisition Program Baseline (APB) containing refined program costs, schedule, and performance objectives.[8] With production approval goes the implicit obligation of significant amounts of organizational and maintenance funds in future years to support the system.[9] During Phase III, Production and Deployment, a stable, efficient production and support base is established. The system is manufactured and deployed with an operational capability that meets mission needs. Phase IV, Operations and Support, overlaps Phase III and begins with a declaration of operational capability or transfer of management responsibility to the maintainer. If a major modification is required, after fielding the system, to meet changing threats or new mission requirements, a Milestone IV, Major Modification Approval, is required to ensure that all reasonable alternatives are examined before committing to a major modification or upgrade program for a system that is still being produced.[10] If the system is no longer under production, a major modification program could be initiated at a new Milestone I decision. Successfully navigating through the milestones and phases of the acquisition process for a major

program, which could take up to fifteen years, is a tremendous challenge. When the acquisition process fails, it results in systems that are too costly, late in fielding, or just don't meet the operational requirements.

Acquisition Problem Areas

The perception of many people over the years has been that the DOD acquisition system is highly inefficient in meeting cost and schedules. This perception has been fostered by the countless news reports of acquisition programs with problems. However, when compared to many large and complex commercial and non-defense projects it has been shown that overall the defense acquisition system has proven to be more efficient in controlling costs and meeting schedule objectives. Additionally, when compared to other countries, the DOD acquisition system had a better record of controlling cost growth and in fielding new military aircraft. However, the shear size of the Defense acquisition program means that a little inefficiency can be costly to the government.[11] Since even small improvements could yield significant gains, the system has been continuously reformed. The main thrusts of the reforms were to create different rules, change organizational roles, and change incentives so that a larger quantity and better quality of information was available to the decision-makers.[12] The milestone review process was instituted in the 1970s to ensure that the top acquisition management had the information to determine if a program and its associated technology were ready to proceed to the next phase.[13] Nevertheless, by the mid-1980s it was evident that new and more drastic changes were needed in the system to support the changing defense system for the 1990s and beyond. The Packard Commission's report identified a significant number of

problem areas and made dozens of recommendations to improve the acquisition process. However, some of the areas that could have significant impact were improvements in joint (multi-service) acquisition, increased participation of the users in generating and refining the requirements, better up-front requirements and concept analysis, and better program management.

The problem with joint acquisition was that it really didn't exist. During the early 1980s the Office of the Secretary of Defense (OSD) was responsible for designating programs as joint, but very few were so designated. Some of those that were such as the Low Cost Fighter, Advance Fighter Engine, and Joint Tactical Missile System (JTACM) became joint in name only due to the lack of support of one of the designated services.[14] Unfortunately, the lack of jointness in acquisition led to incompatible communication systems, shortfalls in airlift capabilities, electrical interference between systems, and incompatible bombs, missiles and bullets.[15]

Another problem area was in the amount of the user's participation in the requirements process. The using command was responsible for writing the MNS, but its role was limited in defining some of the specifications in the System of Operational Requirements Document (SORD).[16] This resulted in problems where operation needs were not properly transformed into contract specifications. The using commands were also not involved in many of the cost-schedule-performance tradeoffs. This resulted in cases where critical operational capabilities were traded off to meet a program's schedule or to reduce costs. The bottom line was that there was not enough operational perspective in the acquisition process and new systems were not meeting operational needs.[17]

The requirements-generation process was failing in the areas of up-front analysis of requirements and concepts. Part of this problem stemmed from the fact that the user did not appear to know the basis for many of their own requirements. Some programs got into cost-schedule problems due to poorly developed requirements that were difficult to meet. Poorly justified requirements gave the public the impression the military was "gold plating" its new weapon systems. The requirements generation system was lacking the capability of tying the specific requirements to specific tasks that could be tied to military objectives that were tied to national objectives.[18] Additionally, the analysis of different alternative concepts was not always very rigorous. Not all of the possible alternatives were evaluated, questionable scenarios were used, and poorly developed operational concepts were used. The end result was poor information being provided to the decision-makers at Milestone I and other major decision points and requirements that were difficult to test.

The area of program management has always been labeled as the biggest problem area and the area that is always under the highest scrutiny. By the 1980s, Air Force Systems Command had grown into very large bureaucratic organization that closely monitored and controlled all of the acquisition programs through its four major divisions. Additionally, they had multiple laboratories that performed research and perfected the latest technologies. These laboratories had a lot of independence in the technology that they pursued and had a lot of influence in pushing their developing technologies into the acquisition programs. This structure was seen by many, in and outside the government, as "a layer cake of bureaucracies in which officers lose sight of the operational needs of the Air Force while pursuing the narrowest goals within the boundaries of their own

office."[19] Other problems stemmed from individuals being placed in critical program decision-making positions without the proper experience and training in the acquisition process. The obvious result was poor decisions that eventually cost the programs. Another problem area was in testing. Optimistic schedules did not always allow adequate developmental and operational testing of systems early in the programs when it was more cost effective for making changes. Program managers also sometimes were too low on funding to properly complete the developmental and operational testing of the systems prior to fielding. This resulted in systems that didn't meet operational needs and that required expensive modifications to allow them to meet operational requirements.

The Packard Commission recommendations to improve the system were taken seriously and became the basis for three implementing vehicles: the National Security Decision Directive 219 in April 1986, the Goldwater-Nichols Department of Defense Reorganization Act in October 1986, and the Defense Management Report in July 1989. The effects of these changes have been significant in improving the acquisition process and have resulted in a major change in philosophy and attitude of all those involved in the process.

Notes

[1] DOD Directive 5000.1, *Major System Acquisitions*, 23 February 1991, p. 1-1.
[2] Ibid., p. 2-2.
[3] Ibid., p. 2-6.
[4] Ibid., p. 2. The costs were adjusted to fiscal year (FY) 1990 constant dollars.
[5] DOD Instruction 5000.2, *Major System Acquisition Procedures*, 23 February 1991, p. 3-4.
[6] Maj Gen Carol A. Mutter, "Marine Corps System Acquisition," *Marine Corps Gazette*, September 1995, p. 59.
[7] DOD Instruction 5000.2., pp. 3-13–3-18.
[8] Ibid., p. 3-24.
[9] Maj Gen Carol A. Mutter, p. 60.

Notes

[10] DOD Instruction 5000.2., pp. 3-26 - 3-30.
[11] Fredrick P. Biery, pp. 644-646.
[12] Ibid., pp. 646.
[13] Ibid., pp. 655-656.
[14] Captain James R. McKenzie, U.S. Navy, *Who is Responsible for the Joint Acquisition Mess?* (Ft. McNair, Washington D.C.: April 1993), p. 15.
[15] Ibid., p.13.
[16] Edward N. Luttwak, p. 171.
[17] Lt Col Robert D. Dillman, p. 6.
[18] Ibid., p. 5.
[19] Edward N. Luttwak, p. 179.

Chapter 3

Requirements Process Changes

Up-Front Analysis

The acquisition process starts with the identification of an operational need in a MNS. However, the reason and logic behind the requirements identified by the operational commands in the MNS were not allows clear. The requirements, in many cases, were not clearly tied to any specific military tasks or objectives. The Packard Commission recognized this and stated in their final report that there was a "great need for improvement in the way we think through and tie together our security objectives, what we spend to achieve them, and what we decide to buy."[1] To resolve this problem, the Air Force rewrote its mission needs and operational requirements guidance to require Mission Area Assessments (MAA) and Mission Needs Analysis (MNA) to form the basis for identifying mission needs and developing requirements. The MAA's purpose is to "identify mission needs using a strategy-to-task process linking the need for certain military capabilities to the military strategy provided by the Chairman of the Joint Chiefs of Staff (JCS)."[2] This process includes reviewing tasks and assigned missions; listing the tasks to accomplish assigned missions; evaluating plans and JCS guidance for changes in missions and objectives; and evaluating the ability to accomplish the tasks. The MNA

then evaluates the Air Force's ability to accomplish the identified tasks and missions using current and programmed future systems.[3] This analysis added credibility to the requirements-generation process and broke-up some of the stove piping that exists in particular weapon systems. Instead of looking at the capabilities and deficiencies associated with only one weapon system under a mission area, the analysis had to examine the overlapping capabilities of all the weapon systems under a mission area. This allowed a clearer picture of the true deficiencies and provided more alternatives for solving them.

The MAA and MNA results were very instrumental in identifying deficiencies for the MNS, but it was evident that longer range analysis and planning were required to fully identify how the mission area deficiencies were going to be fixed. What was needed was a way in showing how the different solutions of all the mission area deficiencies, including support systems, were intertwined and tied to real world budget realities. By ranking deficiencies and fitting them into a budget constrained future for an entire mission area, decision-makers could better determine where their limited resources should go to obtain the biggest payoff. To accomplish this, the Air Force created the Mission Area Plan (MAP).

The MAPs use the MAA and MNA and document the most cost effective means of correcting task deficiencies from among nonmaterial solutions, changes in force structure, systems modifications or upgrades, science and technology applications, and new acquisitions over the next 25 years.[4] The MAPs are reviewed and updated annually, and use modeling and simulation to support the process. The modeling and simulation provide strong analysis tools for evaluating the ability to perform operational and support

tasks, test options to correct deficiencies, and develop investment strategies.[5] An important aspect of the MAP process is that the MAPs are developed and owned by the operational major commands (MAJCOM) that are responsible for the mission area. This has given the user better control of the long range modernization tradeoff planning and decisions. However, support from Air Force Material Command (AFMC) Technical Planning Integrated Product Teams (TPIPT) is essential for modernization planning. The TPIPTs provide the manpower and analysis tools essential for developing deficiency corrective actions, formulation of the Weapon System/Capability Roadmaps, construction of the mission area critical enabling technology needs, and pricing for cost analysis.[6] By closer integration of the user's and developer's planning teams, it is now possible to create a credible long range planning document that is tied to national strategy and objectives.

Jointness

Pentagon critics had a strong case against the DOD in that there appeared to be too much inter-service rivalry in the acquisition process. Lack of cooperation in developing communications system was clearly evident during the Grenada invasion. The biggest issue, according to the Senate Armed Service Committee staff, was "whether the platforms and weapons that are identified as new requirements are the most appropriate platforms and weapons to execute an integrated, unified military approach, not the approach of a single service."[7] To resolve this problem, the Goldwater-Nichols act made the Chairman and Vice Chairman of the JCS the advocates for a joint military perspective. The Vice Chairman was required to chair a special military council on

military requirements and the Chairman was to submit alternative program recommendations and budget proposals to the Secretary of Defense.[8] To accomplish this, the Joint Requirements Oversight Council (JROC) was created with the Vice Chairman as chair and the other service Vice chiefs as members. The JROC's role is to conduct requirements analysis, determine the validity of mission needs, develop recommended joint priorities for those needs, and validate performance objectives and thresholds in support of the DAB.[9]

To accomplish this, the JROC reviews all MNS of potential ACAT 1 programs for validity and joint program applicability. If the JROC determines that the need is valid it forwards the validated MNS to the DAB with recommendations for lead Service, joint potential, and priority.[10] When the JROC first assumed this role there were growing pains and problems overcoming the resistance of the different services. Many observers felt that the JROC was just a rubber stamp that would approve any MNS that came their way. But with time and an increase in the JROC staff, the counsel has become extremely influential. One reason has been that the shrinking defense budget has required greater scrutiny of how the available resources are to be allocated. This has forced a closer look at redundancy between the services and more emphasis on joint acquisition. The other reason has been the strong support of the Chairman of the JCS and his influence on the different acquisition programs through his annual Chairman's Program Assessment that is submitted to the Secretary of Defense as an alternative to the individual services assessments.[11] The JROC supports the Chairman's assessment by making recommendations based on Joint Warfighting Capability Assessments (JWCA). The JWCA looks at nine different areas with a wide range of participating agencies and research organizations

to enhance the flow of ideas and views on the nation's warfighting capabilities. The results of the assessment are then taken to the war fighting CINCs and their staffs for feedback and concurrence. The primary result is that the JROC uses the JWCA results to help develop a draft Chairman's Program Assessment that reflects a joint approach to acquisition and meeting mission needs.[12] The end result of all the emphasis on jointness has been an increase in the number of joint programs and more efforts to reduce incompatibility. The services have had to work closer in harmonizing their requirements into programs that they could support. The emphasis is no longer on why you should be joint, but why you shouldn't be joint.

Analysis of Concepts and Alternatives

With the above changes, a Milestone 0 decision could now be made based on a MNS that is tied to national strategy, validated at the highest military levels, and reflects joint requirements. Along with those changes was an increased emphasis on solid analysis of potential concepts and alternatives for meeting those requirements. A shift was also made to move more of the Phase 0, Concept Exploration and Definition, analysis from the developers to the users. This was accomplished to ensure that the analysis properly reflected how the operational commanders would employ the alternative concepts in realistic scenarios. The key analysis for evaluating potential alternative solutions became the Cost and Operational Effectiveness Analysis (COEA).

A COEA is required at Milestone I for all ACAT I or specifically designated programs. It is normally updated for Milestone II and may be required for Milestone III and IV if requested by the DAB. Its main purpose is to aid decision-makers by showing

the relative advantages and disadvantages of the alternatives being considered and the sensitivity of each to key assumptions (e.g., the threat) or variables (e.g., performance characteristics).[13] The preferred solution from the COEA becomes the basis for the Operational Requirements Document (ORD). The ORD, which replaced the SORD, documents the user's objectives and minimum acceptable requirements for operational performance for the preferred concept or system.[14] The ORD is the primary document for reflecting the requirements, but the COEA has become the key document for decision-makers because it can present a clearer picture of what the user really wants the system to do. The COEA's advantage is that it "puts the system in a scenario; develops measures of effectiveness and suitability; analyzes simulated battle results; and provides justification of the expenditure of the billions that the new program costs."[15]

The COEA has the advantage of being able to show how the employment of alternative concepts is tied to the national military strategy. It is based on the MNS and builds upon the applicable portion of the MAA and MNA. The scenarios that are used in the analysis are required to be based on the Defense Planning Guide which is based on the president's National Security Strategy Report.[16] Another advantage of the COEA is that it is built upon a consensus of the DAB, Air Staff, responsible MAJCOM, developers, intelligence community, and operational testers. The ADM from the DAB specifies a minimum set of alternative concepts to be evaluated, but the Air Staff and MAJCOMs can add additional alternatives they feel should be analyzed. The COEA analysis plan is developed by a team from of all the major players and lead by the responsible MAJCOM. The COEA plan and the draft report of ACAT I program are reviewed and coordinated on by the Air Force COEA Oversight Group. Their review ensures that the COEA reflects

senior Air Force leadership consensus with its analytical foundations (e.g., assumptions, scenarios, models) before submitting it to the Air Force approval authority and the appropriate Office of the Secretary of Defense agency.[17] All the services have very similar processes so joint programs follow the lead service's process and receive the same high level review and coordination.[18] The end result is an extensive operational analysis agreed upon by the senior leadership that compares all the alternative concepts, selects the best one based on cost and operational effectiveness, and provides data on possible cost and performance tradeoffs. The leadership consensus and the operational perspective of the analysis provide the needed insight that the acquisition decision authority needs before committing billions of dollars on a major program.

Operational Requirements Document

The process of up-front analysis, strategy-to-tasked based MNS, and the extensive operational flavor of the COEA have improved the contents of the ORD. Since the ORD is now based on the preferred solution from the COEA, there is extensive analysis available to better help define the operational characteristics and performance parameters. By using the results of the sensitivity analysis, it is easier to distinguish between the critical characteristics and those that are more flexible. The document also has a better operational perspective since it is tied closer to tasks based on national and military strategy. Since supportability issues are part of the COEA, there is now better analysis for determining reasonable reliability and maintainability rates. The ORD is also required to include the measures of effectiveness and measures of performance that were used in

the COEA so that the operational testers have the same measures available for their future testing.[19]

Each of these changes to the requirements-generation process is a small improvement to the process. However, since they are all intimately tied to each other, they form a major change to the process. Now, requirements have a strong strategic policy and analytic basis that make them much easier to understand. With better defined and supported requirements, the program manager has a better basis for establishing and implementing a successful acquisition program.

Notes

[1] Glen A. Kent and William E. Simons, *A Framework for Enhancing Operational Capabilities*, RAND Report R-4043-AF (Santa Monica, CA: RAND Corporation, 1991), p. 2.

[2] Air Force Instruction 10-601, *Mission Needs and Operational Requirements Guidance and Procedures*, 31 May 94, p. 5.

[3] Ibid., p .6.

[4] Ibid., p. 6.

[5] Air Force Instruction 10-1401, *Modernization Planning Documentation*, 22 May 1995, p.2.

[6] Ibid., p. 1.

[7] David C. Morrison, "Joint Acquisition of Major Weapons Likely to Remain an Elusive Strategy," *National Journal*, 4 January 1986, p. 23.

[8] William A. Owens, "JROC: Harnessing the Revolution in Military Affairs," *Joint Forces Quarterly*, Summer 1994, p. 56.

[9] *Glossary: Defense Acquisition Acronyms & Terms* (Ft. Belvoir, VA: Defense Systems Management College Press, September 1991), p. B-56.

[10] Air Force Instruction 10-601, p. 11.

[11] Glenn W. Goodman, Jr., "JROC Guru: An Interview with Admiral William A. Owens," *Armed Forces Journal International*, February 1995, p. 36.

[12] William A. Owens, p. 57.

[13] DOD Instruction 5000.2, p. 4-E-1.

[14] Air Force Instruction 10-601, p. 17.

[15] Dr. Ernest A. Seglie, "The Ever-Current Issues in OT&E," *Program Manager*, September-October 1993, p. 32.

[16] Lt Col Robert D. Dillman, p. 16.

[17] Air Force Instruction 10-601, p. 75.

Notes

[18] Memorandum of Agreement among U.S. Army, Air Force, Navy, Marine Corps, Special Operations Command, and Ballistic Missile Defense Organization, subject: Joint Cost and Operational Effectiveness Analysis (COEA) Policies, Procedures, and Responsibilities, 19 December 1994.

[19] Air Force Instruction 10-601, p. 17.

Chapter 4

Management Changes

A good requirements-generation process provides the program managers with a critical understanding of the mission needs, planned operational environment, and potential areas of tradeoffs. However, the overall management of a program has the highest potential of making or breaking a program. Good, timely decisions by the key decision-makers for a program have the greatest influence on a program's final cost, performance and schedule. Because of this, improvements in management have always made up a large portion of any acquisition reform. Some of the latest changes have been in the areas of chain of command, training, increased user participation, and testing.

Chain of Command

The Defense Management Review implemented some Packard Commission recommendations by streamlining the acquisition chain-of-command. The chain now consists of a direct line from the Defense Acquisition Executive to the Service Acquisition Executive to the Program Executive Officer then to the Program Manager[1]. Even though this may still appear to be a long chain, it is several layers shorter and much cleaner than the previous chain. This change has improved direct communication

between the major players and helped simplify and streamline some of the decision and coordination processes.

Acquisition Training

The 1989 Defense Management Review recommended better training and experience requirements for individuals in key acquisition positions. Based on that recommendation, the Defense Acquisition Workforce Improvement Act was passed that requires DOD to formalized career path for personnel in the acquisition career field to develop a skilled professional workforce. In response, the Assistant Secretary of the Air Force (Acquisition) established a career development program for acquisition personnel. The program is called the Acquisition Professional Development Program (APDP) and it applies to officers, enlisted and civilians occupying acquisition positions.[2] The program is based on a three level functional area certification process that requires specific education, training and experience for each of the eight functional areas; program management, contracting, research and development engineering, manufacturing and production, communications and computers, test and evaluation, logistics, and cost and finance. Different levels of management in each functional area require different certification requirements, with critical positions requiring a level III certification.

The APDP program has been very effective in improving the education and experience of the acquisition work force and in developing a corps of acquisition professionals. The training has not only improved the job knowledge in an individual's functional area, but it improved the overall understanding of all the functional area's roles, how they fit together, and how they each could contribute to better overall

communications and program management.[3] The APDP process has also ensured that key decision-making positions are matched to individuals with a proper level of acquisition training and experience.[4]

User Participation

An important shift in program management has been the dramatic increase of the user's participation in the entire acquisition process. The reality is that cost, performance, and fielding tradeoff decisions are made throughout a program's life and the warfighter's inputs are critical throughout the process. After Milestone I, their participation is needed to ensure the correct tradeoff decisions are made early in the program. Figure 2 shows the impact of the tradeoff decisions to the total life-cycle costs of a program. The early decisions have the biggest impact on the manager's ability to control overall cost of a program. The later changes are made to a program, the more costly it is to implement. Continuous strong participation of the users ensures that they are involved in all of the cost, performance, schedule tradeoffs and improves the users understanding of the impact of late changes to the program.

One reason for the shift was due to a change in the responsibilities for Program Objective Memorandum (POM) submission and defense. The responsibility for the program lines in the POM was given to the user so that they had a bigger say in program priorities and how the program funds were spent. Not only did this cause the users and the developers to work much closer together, but it forced the user to better prioritize their programs and adjust their requirements to meet fiscal realities.

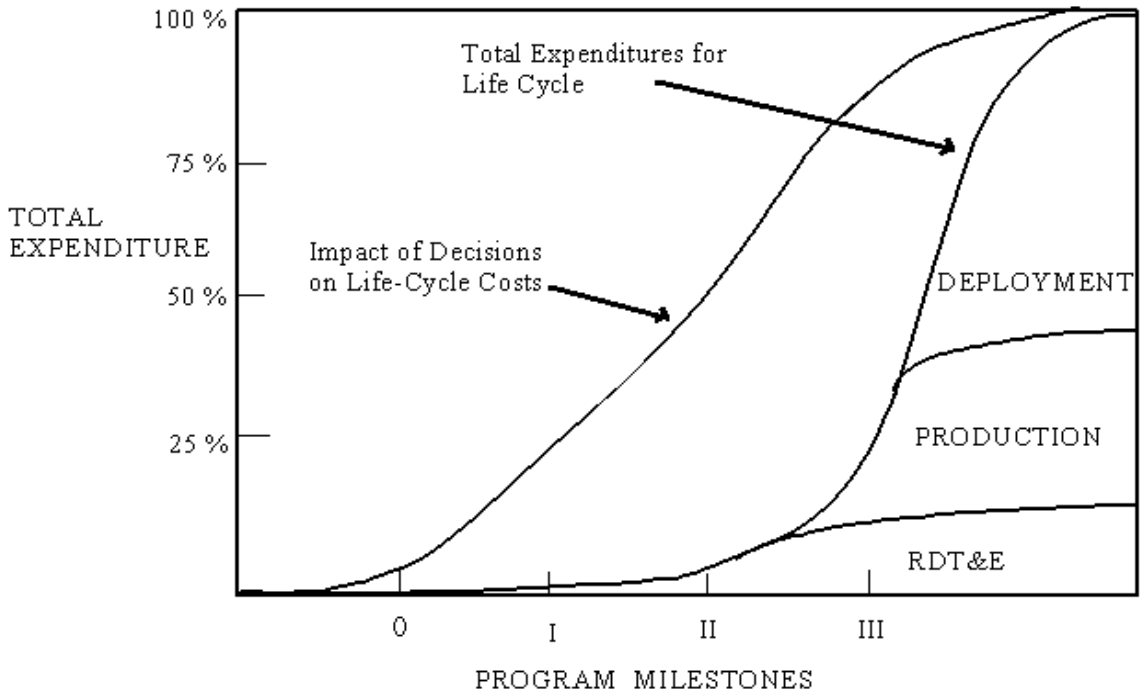

Figure 2. Impact of Decisions on Expenditures[5]

The fiscal realities of the decreasing budget and the need to reduce the cost of research into developing technologies caused more user involvement. The high cost of basic research and growing perceptions that the laboratories had become hobby shops forced the requirement to better justify the projects that they worked on. Instead of allowing the government research laboratories to totally pursue any project that they were interested in, they are now required to obtain user support. They laboratories now actively go to the user to show them how current and planned laboratory projects will support the war fighter and improve or enhance combat capabilities. The users annually rank the technologies based on which ones they feel are the most important or beneficial to meeting their future requirements.[6] The laboratories still have flexibility to continue

research into areas that may not have clear applicability because they are too new or innovative. However, the process keeps the laboratories more focused on meeting the long-term operational needs of the Air Force.

Testing

Testing is one of most effective methods of determining if a weapon system meets operational requirements of effectiveness and suitability, and is ready for fielding. However, the testing must be cost-effective, realistic and credible throughout the acquisition process. The Air Force was at a disadvantage to the other services in that it did not have any single office responsible for ensuring that testing was being done consistently and effectively. In 1992, Headquarters U.S. Air Force created a new office, HQ USAF/TE, to assume responsibility for policy, advocacy of test resources, and oversight of the entire test and evaluation (T&E) process.[7] USAF/TE immediately took the responsibility of improving the process and making it more cost effective and responsive to decision-makers.

One of the biggest problem areas was that systems were completing their Developmental Test and Evaluation (DT&E) without any major problems, but would end up failing their Operational Test and Evaluation (OT&E). Part of this problem came from the fact that the DT&E testers submitted their reports through the program managers and not all of the information got to the OT&E testers. To improve communications and cut costs, Combined Test Forces were created where all the testers worked together and shared their data. This was a major step forward, but operational problems were still not being identified early in programs because of the difference in how DT&E and OT&E

testing is accomplished and what they each look for. One improvement was the increased use of early operational assessments by the operational testers to identify potential problem or risk areas.[8] Additionally, the DT&E side put more emphasis in adding operational realism to their testing to help early detection of potential problems. Another method was the institution of a certification process to certify that a system was ready to transition from DT&E to dedicated OT&E. This process provides senior managers a detailed and disciplined approach for evaluating requirements, testing results up to that point, and if the proper resources were available and ready to support OT&E.[9] This process ensures that the program manger doesn't push a program into OT&E too early just to stay on schedule.

Program consistency between analysis and testing was improved by the requirement to use the COEA measures of effectiveness (MOE) and the measures of performance (MOP) for all analysis and in testing. This has enforced consistency throughout a program and serves as measure of progress from requirements analysis through developmental and operational testing. It also ensures that everyone in the process is focussing on the same goal.[10] The other advantages have been that it has required the users, program managers, and the independent operational testers to work out testing issues earlier in the programs. It has forced early identification of testability issues, better identification of test configuration and resource requirements, and earlier identification of data requirements. By using consistent MOEs and MOPs for all the testing, it allows the senior managers a much better look at how the system is progressing and if it will stay in cost and on schedule.

Notes

[1] Lt Col James F. McGinley, *Reinventing Acquisition Reform* (Maxwell AFB, AL: 14 April 1995), p. 4.

[2] *Acquisition Professional Development Program Guide* (Washington, D.C.: AFPEO/CM, July 1994), p. 5.

[3] Based on writers experience and discussions with acquisition managers at the Defense Systems Management College.

[4] James J. Clark and Norman W. Frigault, "FSAMC—Fundamentals of Systems Acquisition Management Course: Laying the Groundwork for a Permanent Acquisition Workforce, *Program Manager*," November-December 1995, p. 37.

[5] *Test and Evaluation Management Guide* (Ft. Belvoir, VA: Defense Systems Management College Press, August 1993).

[6] Air Force Instruction 61-105, *Planning for Science and Technology*, 22 July 1994, pp. 3-4. Also based on multiple briefings by the Air Force laboratories and HQ AFMC to HQ ACC/DR Division Chiefs from 1992 to 1995.

[7] Air Force Policy Directive 99-1, *Test and Evaluation Process*, 22 July 1993, p. 3.

[8] Dr. Ernest A. Seglie, p. 32.

[9] SAF/AQ memorandum, Subject: Templates for Certification of Readiness for Dedicated Operational Test and Evaluation (OT&E), 18 August 1994.

[10] Dr. Ernest A. Seglie, p. 32.

Chapter 5

Recommendations

As a result of the Packard Commission recommendations a lot of changes have been implemented. Not all of the changes were easy and some faced strong resistance. However, most of the changes that have occurred have had a very positive impact on the system. The linkage from national policy all the way down to specific requirements now exists in many systems. Jointness in acquisition is a growing reality with new weapon systems like the Joint Directed Attack Munition (JDAM) and the Joint Strike Fighter. COEAs and COEA like analysis are becoming more common and their methodology and clarity are receiving praise from the top decision-makers. The acquisition force is better trained, more professional, and is tied much closer to the operational users. Unfortunately, there is still a need for more changes to make the system work as efficiently as it really needs to in a world of tight budgets. The following are a few recommendations that can improve upon some of the changes identified in this paper.

Establish a Funding Source for Milestone I COEAs.

As a result of a Milestone 0 decision the ADM should identify if a COEA is required for Milestone I, the minimum set of alternative concepts to be evaluated, and a source for funding the analysis. Unfortunately, the last item rarely occurs and the lack of a funding

source causes a lot of delay and confusion in the COEA process. The problem stems from the fact that a program doesn't exist before a Milestone I decision, which means there is no program specific funding. The cost of a COEA is primarily based on the number alternatives and scenarios being evaluated. A normal COEA covering between four and eight alternatives in two different scenarios will cost in the range of $2-7 million depending on the complexity of the system and threats. The only available Air Force program element that can be used for COEAs is currently funded at only $7 million for the entire Air Force. Therefore COEAs are being funded by having other programs, which are related or can be enhanced by the systems being evaluated, provide the funding. With the reductions in program budgets this will become difficult to do and the Air Force will need to provide a source for future funding.

Reduce the Amount of Reviews and Coordination Required For Requirements Documents

As a result of increased oversight of the acquisition process, the review and coordination process has grown way out of proportion and has added a significant amount of time to producing the requirement documents and analyses. More than 100 copies of a MNS need to be sent out for the coordination process and it usually requires more than one round of coordination. Five high level reviews are required to get a COEA from the planning to final approval stage. MNS coordination should be reduced to only one round of coordination with those organizations that have direct involvement with the mission need. COEA reviews should be reduced to three: the initial plan, a mid phase, and the final document.

Continue To Emphasize and Improve the MAP Process

The development of the MAP process has been difficult and has had a lot of resistance, but it is now just starting to produce a useful product. The sound analysis tools to help establish a better comparison and ranking of competing systems in a mission area are still being developed or evaluated. It will take a couple more iterations of the process before a good sound methodology can be established and applied evenly across all the mission areas. However, there are individuals and groups that are pushing to get rid of the process. Even though there are problems with the MAP process, it is the only real approach available for developing an optimal solution to mission needs with a reduced budget.

Create Closer Ties between DT&E and OT&E

One of the best methods of reducing the cost and time required for testing is to reduce the amount of duplicated test points. Under the present system, there are some artificial barriers in collecting and using test data that causes more duplication than is necessary. There is a Title 10 requirement to keep DT&E and OT&E separated, but that pertains primarily to the analysis methods. Better use of combined data bases, integrated planning, and sharing of assets could cut down on duplication of effort. The increased emphasis on adding more operational reality to DT&E, the use of more early operational assessments, and the emphasis to have assets ready when the dedicated OT&E begins, have increased efficiency and should result in fewer duplicated test points if more sharing of data was allowed.

Increase the Use of Modeling and Simulation as an Aid to Testing

The extreme high cost of maintaining a test infrastructure and the complexity of testing highly integrated systems is extremely expensive. One way of improving test efficiency is by using more modeling and simulation to help determine what test points need to be flown, which points need only a spot check, and to practice difficult or critical test points. Modeling and simulation cannot replace testing, but it can be a valuable tool for focusing your test efforts and getting the most out of each test point.

Chapter 6

Conclusions

Since the Packard Commission published its final report with sweeping recommendations in June 1986, a lot of changes have occurred in defense acquisition system. The National Security Decision Directive 219, the Goldwater-Nichols Department of Defense Reorganization Act, and the Defense Management Report were the main instruments for most of the changes. The primary purposes of the reforms were to improve the military advice to the senior leadership, improve military strategic planning, improve acquisition management, and provide better linkage between national security objectives and the DOD budget request for weapon system development and procurement. Overall, the changes that have occurred have been very successful in meeting those objectives. The increased involvement of the Chairman of the JCS has refocused the entire process toward supporting national security objectives and efficiency through jointness. The use of the strategy-to-task process has tied national security objectives to the requirements and produced more credible basis for mission needs. The MAP process is becoming the basis for improved long range planning. The increased use of rigorous up front analysis has given the decision-makers a much better look at how alternative concepts would be used, supported, and perform in a realistic scenario. The increased involvement of the war fighters throughout the process has improved the focus

on the operational needs, but it has also improved the cooperation between the users and developers since they are both intimately involved in the cost-performance-schedule tradeoff process. Streamlining the acquisition chain-of-command, improving training, and improving the testing process have produced better and more timely information for the decision-makers and have reduced costs.

Overall, the U.S. defense acquisition process has been able to develop the weapon systems that we have needed in the past. Unfortunately, not all the systems worked correctly, were cost effective, or were available when needed. The latest set of reforms has gone a long way in improving the acquisition process and ensuring the new weapon systems will be able to meet operational needs in the future. However, more reform is still required since the process is still too large, cumbersome, and over regulated. Many of those in top management understand this and have taken action for more improvements. The Secretary of Defense formed an Acquisition Reform Oversight and Review Process Action Team to develop a plan for making the process more effective and efficient[1]. If adopted, their proposals will go along way in reducing the amount of cumbersome reviews and excessive oversight.

Defense acquisition reform is process that will probably always be around due to the cost and importance to our national security. But, we can be confident that with some of the latest changes the acquisition process, we will be able to better meet the mission needs even in a world with tighter budgets.

Notes

[1] Collie Johnson, "Reengineering the Oversight and Review Process for Systems Acquisition," *Program Manager*, May-June 1995, p. 6.

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